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IBM Docket No. GB9-2000-0032

REMARKS

Status

Claims 1-7 and 14-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the teaching of US Patent No. 6,434,605 (hereinafter "Faulkner") in view of the teaching of US Patent No. 6,434,086 (Martin). Claims 8-13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the teaching of Faulkner in view of the teaching of US Patent No. 6,353,838 (hereinafter "Wong").

Claims 1-20 are presented for reconsideration in view of the analysis provided below.

Analysis

The Examiner relies on the Faulkner teaching as a primary reference. It is indicated at page 6 of the recent Office Action that, at col.1, lines 33-51, that Faulkner teaches:

"storing, within a first data storage structure of the shared resource, unit of work descriptors for operations performed in relation to said shared resource by the resource managers in said group". (Italics added to highlight quotes) Indeed this description is the language of Applicants' claim 1 at lines 7-9.

But the cited Faulkner text teaches message queues where messages are defined by Faulkner (col.1, lines 31-34) as: *"a string of bytes that has meaning to the applications that use the message. Each message includes application data and a message descriptor."* The term "unit of work" (hereinafter UOW) is not mentioned. Nor, is there mention of storing in a shared resource UOWs performed relative to the resource by resource managers of said group.

Applicants' specification, at page 21, states that *"A unit of work is a term of art that refers to a recoverable series of operations performed by an application between two points of consistency."*

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A unit of work begins when a transaction starts or after a user requested synchronization point (syncpoint). It ends at a user-requested syncpoint or at the end of a transaction. A unit of work may involve an application performing a set of operations such as getting a message from a queue, making a database entry based on the contents of the message and putting a different message back onto a queue indicating the results of the database operation. " (Bolding added for emphasis). A stored UOW as defined by Applicant may describe operations on messages but is not a message as described by Faulkner.

Faulkner's description of a message and Applicants definition of unit of work, with following discussion of how it would relate to a message queue, make it clear that Faulkner's storing messages in a queue is not at all like or suggestive of *"storing, within a first data storage structure of the shared resource, unit of work descriptors for operations performed in relation to said shared resource by the resource managers in said group."* Again, Faulkner doesn't even discuss UOW, let alone a group of resource managers sharing UOW descriptors at a shared resource. It is respectfully submitted that the cited portions of Faulkner reference fall far short of supporting the teaching asserted in the Office Action.

Faulkner teaches system repair without operator intervention - repair of the connection (Figs. 11 and 12), repair of a channel initiator or listener (Fig. 10) or resolving a sequence error (col.3, lines 58-63) so that the original effort to normally process the transaction that is underway can proceed. Applicants, on the other hand, save UOW descriptions at a shared resource and **enable a different resource manager to step in and abnormally recover the UOW**, should the channel other problem that thwarted the original resource manager persist. This is a major departure from the Faulkner teaching and is emphasized in the claim language as is discussed more fully below.

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The Office Action at page 6 indicates that Faulkner teaches, at col.3, lines 19-25, "sending a notification of a connection failure between a second data storage structure of *the shared resource and a first resource manager within said group, the notification being sent to the remaining resource managers within the group which are connected to the second data storage structure.*" Faulkner states, at col.3, lines 23-25, "If such efforts fail, **notifications in the form of reports, pages or emails** may be sent to appropriate parties to advise the parties of the problem. At col. 9, lines 1-9 even **"telephone calls"** are mentioned for notification. (Bolding added for emphasis)

This Faulkner notification is not notification of *"resource managers...which are connected to the second data storage structure"* as called for in Applicants' claims - this Faulkner notification is a telephone call to the repair shop to send the repair specialist. The claim language from Applicants' claim 1 cited by the Examiner has a specified destination - where is that destination taught in Faulkner? Faulkner teaches a call or email to alert people that the restart effort of Faulkner has failed - further help is needed. Again, it is submitted, the teaching of the reference falls woefully short of the identified claim language against which it is asserted.

Moreover, after notice, the claim calls for *"one or more of said remaining resource managers accessing said first data storage structure and analysing the unit of work descriptors to identify the units of work relating to the second data storage structure that were being performed by the first resource manager when the connection failure occurred; and*
said one or more remaining resource managers recovering the identified units of work.", which is not taught or suggested by Faulkner.

Applicant's resource managers (see Applicant's specification at page 2, line 24 - page 3, line 6) are elements of the network not repair people that read emails and facsimiles and Applicants'

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remaining resource managers analyze and recover a UOW in response to notification (in contrast to, for example, repairing the connection).

The Examiner states at page 7, full para. 1, of the Office Action that Martin teaches "*said one or more remaining resource managers recovering the identified units of work* (citing Martin col. 5 lines 31- 42 and col. 26, lines 16-19)." Martin indicates at col. 5, lines 31 -34 that "*the EDM system operates to create a corresponding sub-unit of work value for each of the SET calls and store the sub-unit of work values in a table.*" Martin at col. 26 seems to be describing normal system operation and not remaining resource managers that take on the work of recovering an aborted UOW. It is not clear that the Martin system even provides for applications having a group of resource managers, let alone remaining ones, to recover UOWs.

Martin at col 31, lines 4-17, indicates: "*In prior art systems, since changes are normally either committed or aborted as a single entity, according to the application's unit of work, valid changes within the unit of work, which are made after a SETS/SETU call, cannot be committed.*" *The present invention comprises a system and method for more intelligently recording changes for improved processing. According to the present invention, the EDM system operates to create sub-units of work for storing changes during SETS/SETU and ROLS calls. This allows the EDM system to individually record the status of these changes, and either discard and/or commit the individual changes within that total application's unit of work, depending on the SETS/SETU and ROLS calls received.*

It would seem that Martin does not abort a UOW upon a failure. The EDM keeps track of sub-units of a UOW in process and salvages valid sub-units. There is no teaching of recovery of the aborted sub-units, however. There is no remaining group of resource managers that share a resource with stored UOW descriptions. There is no discussion of remaining resource managers being notified and acting to recover the UOW. Apparently the EDM continually monitors work

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that is done in sub-units, as it is being done, and when a problem occurs it saves sub-units already performed properly and discards those that are defective. Again, there is no mention of shifting the processing of a UOW to remaining resource managers that are notified of a connection failure.

Martin, hence, is not a teaching or suggestion for recovery of the full UOW. Martin, apparently, leaves recovery to the prior art approach - fix what is broken. The EDM salvages those pieces (sub-units) of an aborted UOW already processed satisfactorily so as to be committable and aborts the rest. (See Martin Abstract, last sentence, and col. 31, lines 14-17: *"This allows the EDM system to individually record or monitor the status of these changes, and either discard and/or commit the changes within that total application's unit of work, depending on the SETS/SETU and ROLS calls received."*) Faulkner teaches fixing the system problem or sending a repair alert notice to selected parties; and, adding Martin only serves to lessen, by saving sub-units, the work to be done after the system is fixed. This is not at all like Applicants' claimed invention which provides for recovery of the UOW, even without fixing what is broken, using remaining resource managers of a group that share a resource that has stored therein the description of the UOW that was aborted by a connection failure. As explained above the Faulkner teaching, augmented by the Martin teaching, falls far short of Applicants' claimed inventions.

The Office Action's application of the prior art, it is respectfully submitted, glosses over critical detail of the claims which strongly emphasize this fundamentally different approach to aborted UOWs, using a group of resource managers sharing a resource with stored UOW descriptors, resource managers that receive notice of a connection failure for one of their number resulting in remaining resource managers of the group recovering UOWs being processed by the disconnected group member. Details of the sharing of the resource, the destination of the notice and the response to the notice are present in the claims but are lacking or different in the prior art,

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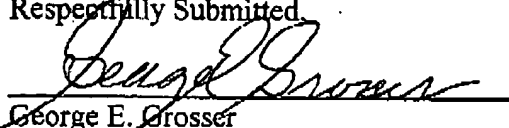
as is explained in the analysis above. The Wong teaching which relates to storing messages in queues, with their state, in a contiguous space does not overcome or even address the deficiencies identified above with the teaching of Faulkner as augmented by Martin.

While some the above analysis focused on contrasting the language of claim 1 with the prior art teaching of Faulkner and Martin, the other independent claims 15, 19 and 20 also include language emphasizing the aspects of a group of resource managers with a shared resource, storing UOW descriptions at the shared resource, the notice to the group of a connection failure to a member and remaining group members recovering the UOW, which those teachings taken alone or together fail to provide. Hence, for the reasons discussed above, the other independent claims are believed to clearly identify inventive subject matter over the prior art. And, the dependent claims are believed to identify inventive subject matter over the prior art for at least the same reasons that their independent claims do. Accordingly, it is respectfully requested, that the rejection of claims 1-20 be withdrawn.

In accordance with the foregoing, it is believed that this case has been placed in condition for allowance and early notice to that effect is earnestly solicited.

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Respectfully Submitted,



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